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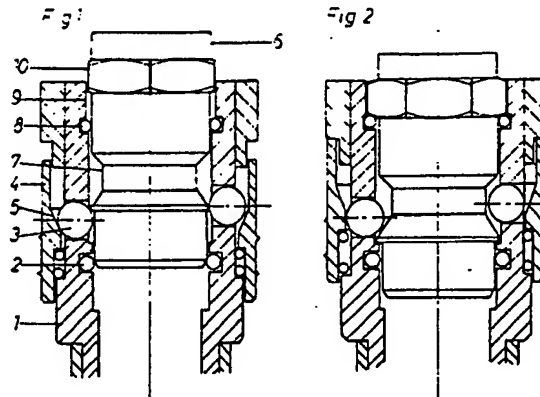
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④ Quick-acting coupling of the ball-catch type.

⑦ The invention relates to a quick-acting coupling of the ball-catch type comprising a coupling housing (1) with coupling means and allowing insertion of a nipple member (6), which is positioned and fixed in the coupling housing provided with a ring (8) adjacent the end of insertion, said ring (8) being situated in a ring groove for radial fixation of the nipple member (6), said coupling housing (1) further comprising a sealing ring (2) situated after the balls (3) when seen from the end of insertion of the nipple member (6). The fixing means (8) radially retaining the nipple member (6) is spaced from the sealing ring (2) being of a radius larger than the radius of the nipple member (6). The coupling housing (1) and the nipple member (6) are further provided with means (9, 10) retaining them in one or more mutual positions in the circumferential direction.



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Quick-acting coupling of the ball-catch type

The present invention relates to a quick-acting coupling of the ball-catch type for a precise positioning and fixing of the nipple member inserted in the coupling.

Quick-acting couplings of the ball-catch type have been known for many years, cf. for instance US-PS No. 2,919,935. Previously these couplings were mainly used for interconnecting two hoses or a tube and a hose. The couplings are very suited for this purpose because the nipple member inserted in the coupling housing is capable of compensating a turning of the hose by being turnable in the coupled state. The latter effect has in turn been achieved by sufficiently high tolerances between the coupling housing, the nipple member, and the balls.

Compared to the above couplings the so-called claw clutches or bayonet clutches present a more rigid coupling, and usually they can also be used for considerably higher pressures than the common quick-acting couplings of the ball-catch type. However, these clutches can only be coupled in a predetermined fixed position, and usually they are of considerable outer dimensions with the result that they appear rather clumsy.

The object of the present invention is to provide a quick-acting coupling of the ball-catch type and of small outer dimensions even for rather high pressures, and which is very simple and in addition capable of fixedly retaining the nipple member in a predetermined position, i.e. involving no play in radial direction. The latter is of great importance in cases where the nipple member is mounted for instance in a long tube and under high pressure, as for instance a play of 1 mm in the coupling housing causes a considerable play at the end of the tube, the latter being completely unacceptable in some cases.

The above object is according to the invention obtained by a quick-acting coupling being characterised by comprising fixing means radially retaining the nipple member being spaced from the sealing ring being of a radius larger than the radius of the nipple member, and by the coupling housing and the nipple member being provided with means retaining them in one or more mutual positions in the circumferential direction. In this manner the positioning means and a fixing ring control the inserted nipple member.

Furthermore the positioning means may be polygonal, preferably pentagonal or hexagonal, whereby the nipple member can be mounted in the coupling in five to six predetermined permanent positions without play.

The positioning means may according to the

invention be of the tongue-and-groove type, including splines, whereby the nipple member can be mounted in either one or more predetermined permanent positions. The number of position is only limited by the number of grooves allowed in the circumference of the nipple member.

Moreover according to the invention the positioning means may be center holes or milled slots co-operating with three or more balls, whereby it is possible to use the balls as positioning means. Then the number of coupling positions depends on the number of center holes or milled slots allowed in the nipple member.

The invention is described below with reference to the accompanying drawings, in which

Figure 1 is an axial sectional view of a coupling with hexagonal positioning means in the nipple member and the coupling housing,

Figure 2 corresponds to Figure 1, but here the nipple member has been turned 60° inside the coupling housing and is completely engaged,

Figure 3 is an end view of the embodiments of Figures 1 and 2 without the nipple member,

Figure 4 is an end view of yet another embodiment of the coupling,

Figure 5 is an axial sectional view of a further embodiment.

The quick-acting coupling comprises a coupling housing 1 with a sealing ring 2 and coupling balls 3. A coupling and decoupling ring 4 is situated on the outside of the coupling housing. By axially moving the ring 4 by means of the surface 5 said ring influences the balls 3 in radial direction so as to engage the groove 7 in the nipple member 6 and vice versa at the decoupling. The coupling housing is furthermore provided with a fixing ring 8 for retaining the nipple member 6 in radial direction. Both the coupling housing 1 and the nipple member 6 are further provided with polygonal inner 9 and outer 10 positioning means. According to Figure 5 inner 11 and outer 12 positioning means can also be situated somewhere else. Furthermore, according to the embodiment of Figure 4 an outer 13 and inner 14 positioning means can also be a single or multiple tongue-and-groove joint, and they can also be differently positioned. According to the embodiment of Figure 5 the balls 3 can also be used for positioning the nipple member 6 by said balls engaging center holes 16 or milled slots 15 both present in the groove 7.

A highly increased use of for instance high-pressure cleaners, cleaning and spraying chambers as well as painting chambers and automated painting machines has formed the basis of the invention as all these operations involve the use of a quick

coupling and decoupling of preferably permanent tubes of a certain length and provided with various tools. As the tubes are usually bend into different shapes so as to discharge a liquid at a predetermined location and always the same location each time the tool is mounted, it is very important to ensure the accurate positioning.

It appears from the above that the quick-acting coupling according to the invention is also suitable in connection with for instance garden watering in case an extension tube is to be coupled to the hose connection, said extension tube comprising various nozzles for instance for spraying fruit gardens, washing windows or cars, flushing etc. Numerous application possibilities exist where a turnable coupling is not desired.

Claims

1. A quick-acting coupling of the ball-catch type and comprising a coupling housing (1) with coupling means and allowing insertion of a nipple member (6), which is positioned and fixed in the coupling housing provided with a ring (8) adjacent the end of insertion, said ring (8) being situated in a ring groove for radial fixation of the nipple member (6), said coupling housing (1) further comprising a sealing ring (2) situated after the balls (3) when seen from the end of insertion of the nipple member (6), characterised in that the fixing means (8) radially retaining the nipple member (6) is spaced from the sealing ring (2) being of a radius larger than the radius of the nipple member (6), and that the coupling housing (1) and the nipple member (6) are provided with means retaining them in one or more mutual positions in the circumferential direction.

2. A quick-acting coupling as claimed in claim 1, characterised in that the positioning means are polygonal, preferably pentagonal or hexagonal (9, 10, 11, 12).

3. A quick-acting coupling as claimed in claim 1, characterised in that the positioning means are tongue-and-groove joints (13, 14), including splines.

4. A quick-acting coupling as claimed in claim 1, characterised in that the positioning means are center holes (15) or milled slots (16) co-operating with three or more balls.

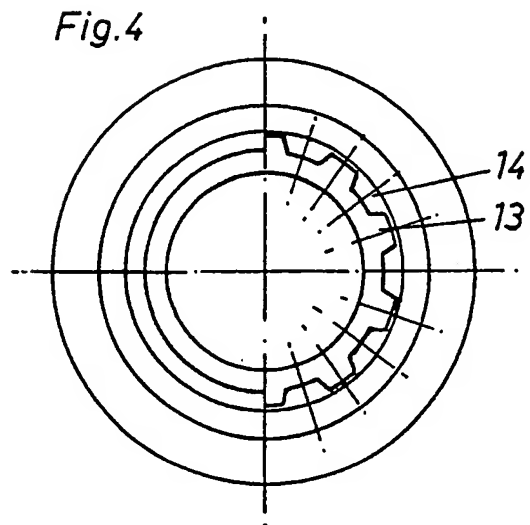
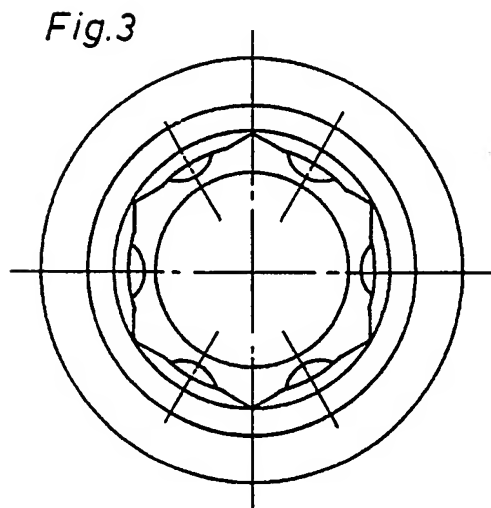
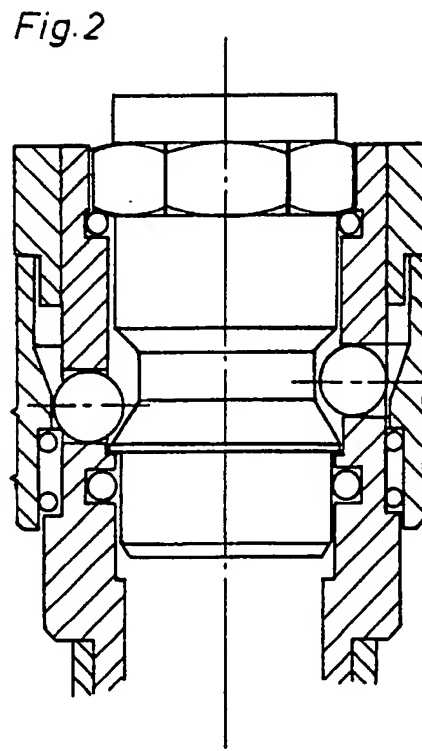
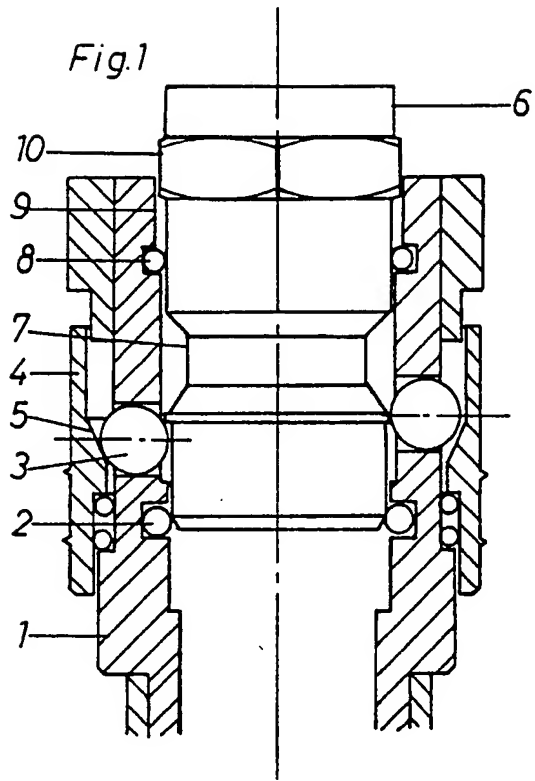
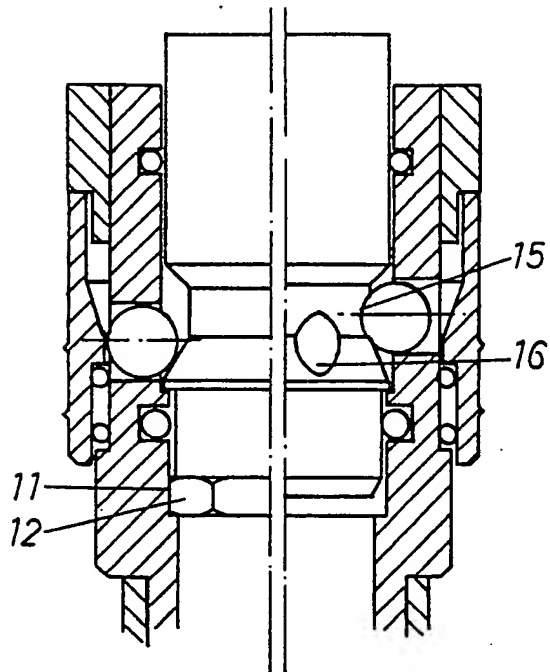


Fig. 5





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.3)
X	DE-B-1 181 997 (WALTHER) * claim 1, figures 1-6 * ---	1,2	F 16 L 37/22
A	DE-A-3 607 088 (CAJON) * figures 2,3 * ---	3	
A	DE-U-1 953 842 (BERGHOEFER) * page 3, lines 1 to 18 * ---	4	
A	FR-A-2 406 149 (GOURNELLE) * figure 2 * ---	1	
D,A	US-A-2 919 935 (NYBERG) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.3)
			F 16 L 37/00
Place of search BERLIN		Date of completion of the search 01-03-1989	Examiner SCHLABBACH M
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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